10/522721

DT Rec'd PCT/PTO 28 JAN 2005

PATENT
P56713US

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: CLIFFORD L. JORDAN

PCT International Application No. PCT/US2003/019560 filed 17 July 2003

Serial No.:	*to be assigned*	Examiner:	*to be assigned*
Filed:	28 January 2005	Art Unit:	*to be assigned*
For:	COMBINED AIRCREW SYSTEM TESTER (CAST)		

INFORMATION DISCLOSURE STATEMENT

Mail Stop PCT
Commissioner for Patents
P.O.Box 1450
Alexandria, VA 22313-1450

Sir:

In accordance with 37 C.F.R. §1.56, and §§1.97 and 1.98 as amended, Applicant cites and describes the following art references. Under 37 C.F.R. §1.98(a)(2), a copy of U.S. patent reference(s) is not attached.

1. U.S. Patent No. 4,344,144 to Damico *et al.*, entitled *APPARATUS FOR CREATING GAS FLOW CYCLES*, issued on August 10, 1982;
2. U.S. Patent No. 4,796,467 to Burt *et al.*, entitled *TESTING DEVICE FOR RESPIRATORY PROTECTIVE DEVICES*, issued on January 10, 1989;
3. U.S. Patent No. 4,846,166 to Willeke, entitled *NON-INVASIVE QUANTITATIVE METHOD FOR FIT TESTING RESPIRATORS AND CORRESPONDING RESPIRATOR APPARATUS*, issued on July 11, 1989;
4. U.S. Patent No. 4,914,957 to Dougherty, entitled *LEAK TEST ADAPTOR APPARATUS FOR FACILITATING LEAK TESTING FACE MASK RESPIRATORS*, issued on April 10, 1990;

5. U.S. Patent No. 5,245,993 to McGrady *et al.*, entitled *PILOT'S ENSEMBLE WITH INTEGRATED THREAT PROTECTION*, issued on September 21, 1993;
6. U.S. Patent No. 5,289,819 to Kröger *et al.*, entitled *DEVICE FOR OPERATING AND TESTING GAS MASKS AND BREATHING EQUIPMENT*, issued on March 1, 1994;
7. U.S. Patent No. 5,318,018 to Puma *et al.*, entitled *ADVANCED AIRCREW PROTECTION SYSTEM*, issued on June 7, 1994;
8. U.S. Patent No. 5,477,850 to Zegler *et al.*, entitled *INTEGRATED BUOYANCY SUIT CREW PROTECTION SYSTEM WITH +/-G_Z PROTECTION*, issued on December 26, 1995;
9. U.S. Patent No. 5,860,418 to Lundberg, entitled *METHOD AND AN ARRANGEMENT FOR CHECKING THE OPERATION OF BREATHING EQUIPMENT*, issued on January 19, 1999;
10. U.S. Patent No. 6,245,009 to Travis *et al.*, entitled *OPERATIONAL READINESS AND LIFE SUPPORT SYSTEMS*, issued on June 12, 2001;
11. U.S. Patent No. 6,425,395 to Brewer *et al.*, entitled *DETERMINATION OF MASK FITTING PRESSURE AND CORRECT MASK FIT*, issued on July 30, 2002; and
12. U.S. Patent No. 6,435,009 to Tilley, entitled *PORTABLE MULTI-FUNCTION SYSTEM FOR TESTING PROTECTIVE DEVICES*, issued on August 20, 2002.

Damico *et al.* '144 discloses an apparatus for creating gas flow cycles, which comprises a housing defining a chamber (80) provided with gas functions and a passage (76) for connection with an equipment to be tested. A unit movable in the housing throttles the passage. The position of the unit (75) is controlled by electrical signals received from a control unit. Sensors supply electrical signals representative of the position of the mobile assembly and of the pressure. The junctions are provided for connection with gas sources at different pneumatic pressures through solenoid valves.

Burt *et al.* '467 related to an automated test equipment that performs quantitative tests and operational checks on respiratory protective devices including self-contained breathing apparatus

(SCBA). The testing device is comprised of a bench-top instrument cabinet containing electronic, electro-mechanical, and pneumatic components, a test head with the likeness ofhuman form attached on top of the instrument cabinet, a detachable computer keyboard, and a pneumatic manifold and hose assembly. With the present invention, a layman operator can determine the readiness of the SCBA equipment for service. The present invention can also be used as a diagnostic tool during maintenance procedures.

Silleke '166 relates to a method and apparatus for conducting the method for non-invasive, quantitative respirator fit testing. The method includes the step of having the wearer properly position the respirator over his nose and mouth, inhale to create a negative pressure inside the respirator cavity volume, hold his breath and record the pressure differential versus time decay rate between the pressure inside the respirator cavity volume and that of the surrounding environment. The method may also include establishing a leakhole ofknown dimension, repeating the above steps and determining the volume of the respirator cavity based upon the results of the recorded differential pressure versus time by comparing the result to calibration curves. The apparatus of the present invention includes modifying a conventional face mask respirator by providing the respirator with a pressure sensor and a leakhole of known dimension. Preferably, the apparatus can also include a calculator to continuously calculate a quantitative factor to indicate the degree of protection, which is based upon the volume of the respirator cavity divided by the volumetric flow rate through the leakhole or holes of unknown dimension and location for a standard unit of time, given an initial negative pressure in the respirator cavity.

Dougherty '957 relates to a leak test adaptor apparatus for facilitating leak testing face mask respirators which includes an outer member having a bore therethrough, the bore having a first end and a second end; an inner member disposed in the bore of the outer member, the inner member having a channel therethrough defining a flow path for passage of the gas through the channel from the first end to the second end of the bore; a pressure responsive valve connected to the inner member for regulating the flow of the gas through the channel; and a gas sampling port in

communication with the bore for sampling the gas in the bore. The pressure responsive valve closes the channel when the gas pressure near the second end of the bore is greater than the gas pressure near in the channel and opens the channel when the gas pressure nearer the second end of the bore is less than the gas pressure in the channel. The pressure-responsive valve, which is disposed in the flow path of the gas, includes a valve seat connected to the inner member, a valve shaft connected to the valve seat, and a substantially thin disk-shaped gate member slidable connected to the valve shaft, which gate member is capable of closing and opening the channel by sliding along the valve shaft when acted upon by the difference in gas pressure between the channel and the second end of the bore.

McGrady *et al.* '993 discloses a pilot's ensemble which provides protection against cold water immersion and hostile threats, such as chemical and biological agents, while minimizing bulk and weight of the ensemble and impacts to and burdens on the pilot. The ensemble includes a garment (40) having an outer shell (14) impermeable to liquids and gases and a lining (58) bonded to an inner surface of a torso portion of the shell (14). Air is supplied to the lining (58) through a ventilation port (42) to control body temperature. Ensemble headgear includes a helmet (76) with upper and lower pairs of mounting members (78, 80, 82, 84). A permeable hood (70) is worn under the helmet (76) and has chemical vapor absorbing neck portions. A breathing mask (92) is removably attachable to the lower pair of mounting members (82, 84). Goggles (96) are removably attachable to the upper pair (78, 80). The goggles (96) seal the ocular cavity of the pilot and overlap the mask (92) and hood (70) to completely cover the pilot's face. A passageway (86) in the helmet (76) routes inflowing air to the goggles (96) to prevent fogging and maintain pressurization of the ocular cavity to prevent inboard leakage. Elements of the ensemble are selectively doffable in flight.

Kröger *et al.* '819 relates to a testing device for gas masks and breathing equipment which has a head part, to which the gas mask and breathing equipment can be connected and which is connected to a testing unit simulating the respiratory activity. The testing device provides more accurate testing especially with respect to the pressure and flow conditions. Using a valve (11, 13),

which interrupts the flow connection and is provided at the testing connection in close proximity, in terms of flow, of the respiration connection.

Puma *et al.* '018 relates to an advanced aircrew protection system which comprises a helmet assembly adapted to sustain a full pneumatic pressure within the helmet adjacent to the head of the wearer; a suit assembly adapted to sustain a pressure adjacent to selected parts of the body of the wearer; a neck shroud operatively coupled with the helmet assembly and the suit assembly and adapted to pneumatically isolate the helmet assembly from the suit assembly; and controller adapted to independently supply fluid under pressure to the helmet assembly and to the suit assembly. Within the helmet is a dual compartment for an independent supply of fluid to an oral nasal mask separate from the remainder of the helmet assembly.

Zegler *et al.* '850 relates to an apparatus for maintaining useful consciousness and reducing the risk of injury for a subject exposed to high levels of acceleration with substantial components in the $+G_Z$ or $-G_Z$ direction while in a vehicle. It comprises a buoyancy force suit for supporting the subject with a buoyancy force, the force suit including at least two layers of flexible material, each layer being relatively impermeable to a substantially incompressible fluid having a specific gravity approximating blood being locatable in a space between the layers. A pressure helmet supports the subject's head with a gas pressure force. A Pressure Transfer System (PTS) provides pressure transfer and equalization between the suit and the pressure helmet. The PTS comprises a fluid reservoir segment and a gas reservoir segment. The fluid segment is in fluid communication with the space between the layers of the buoyancy force suit for maintaining a substantially constant fluid level within the suit at all times. The gas segment is in gas communication with space internal to the pressure helmet for maintaining gas pressure force in the helmet substantially equivalent to fluid pressure within the fluid segment of the PTS. A breathing assist mechanism (BAM) senses the pressure of the fluid within the force suit at the subject's chest level, and provides breathing gas to the subject at pressures substantially equal to the chest level fluid pressure and independent of pressure within the pressure helmet.

Lungberg '418 relates to a method of verifying function and status of breathing equipment, wherein the breathing equipment includes a gas supply, a closure valve on the gas supply, a primary pressure regulator downstream of the closure valve, a pressure sensor, a secondary pressure regulator downstream of the primary pressure regulator, a breathing mask downstream of the secondary pressure regulator, an indicator, a processor connected to the pressure sensor and the indicator, and gas lines between the gas supply, the primary pressure regulator, the secondary pressure regulator, and the mask. A processor for receiving sensed data, comparing the sensed data to control values, and producing an output signal is activated. At least one functional or status variable within the equipment is measured. The at least one measured value is compared to a corresponding control value with the processor. An output signal based upon the comparison is produced. The output signal is transmitted to an indicator to indicate whether the at least one measured value substantially corresponds to the at least one control value.

Travis *et al.* '009 relates to a wearable life support system which integrates an antigravity compensation apparatus for providing counter-pressures on the human body in response to antigravity conditions with an environmental defense apparatus for providing operational conditions to a human within the life support system. A filtration apparatus removes harmful conditions from breathable gas provided to a human within the system. A temperature control apparatus maintains operational conditions to a human within system. A vision maintenance and protection apparatus is kept clear through use of a demisting apparatus that prevents visual distortion of a visor covering the human visual field. The Demisting apparatus is integratable with a wearable life support system that provides environmental defense and/or antigravity compensation to the human user. A portable environmental apparatus provides ground and back-up life sustaining conditions to a human within wearable life support systems.

Brewer *et al.* '395 relates to a CPAP treatment apparatus, as one form of positive pressure ventilatory assistance, which includes a turbine/blower, operated by a mechanically coupled

electrical motor that receives air or breathable gas at an inlet thereof, and supplies the breathable gas at a delivery pressure to a delivery tube/hose having a connection at the other end thereof with a nose mask. A microcontroller has an operational "Mask-Fit" mode. An initial constant pressure level is applied by the blower to the mask. If the functional mode is a manual mode, then the mask-fit test pressure is the current `set` pressure. If the functional mode is the automatic titration mode, the mask-fit test pressure is the 95th percentile pressure of the previous session, otherwise it is the base treatment pressure, e.g. 10-12 cm H_2O. This constant pressure is applied for a period of time, typically 1-3 minutes. The microcontroller continuously determines mask leak as the value, f_{LEAK}, from a flow sensor, comparing this to a threshold, and providing the patent with a visual indication of degree of leak. In this way the patient can manipulate the mask to ensure correct fitting as indicated by the appropriate message or indication.

Tilley '009 relates to a multi-function device for testing masks such as NBC masks used in civilian and military applications. In its preferred form, the device is self-contained and can be readily transported to field sites by one or two individuals. The device includes a protective storage and transport case. The case includes an upper portion and a lower portion. The upper portion of the case houses the power unit assembly and includes sufficient storage space to store such things as an aerosol generator reservoir, various headform accessories, a containment shroud, manuals (e.g. installation, operation and maintenance manuals) and nominal tools. The lower portion of the case houses the head assembly and controller unit which are preferably mounted on a cover or top panel. Underneath the top or cover panel of the lower portion of the case are stored the light scattering chamber, flow sensor, pressure transducer, circuit boards and valves. The device can perform multiple tests including (1) an overall mask leakage test; (2) an outlet valve leakage test; (3) a drink seat test; (4) a drink tube flow test; (5) a drink train leakage test; and, a mask fit test. Further, the device can be programmed for any given test period to perform one or all of the aforementioned tests. The device further can readily create a data log to record results of any given test or series of tests. The device further includes numerous safety features including requiring any operator of the device to reject or retest a defective mask.

The citation of the foregoing references is not intended to constitute an assertion that other or more relevant art does not exist. Accordingly, the Examiner is requested to make a wide-ranging and thorough search of the relevant art.

No fee is incurred by this Statement.

Respectfully submitted,

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Date: 1/28/05
I.D.: REB/kf

10/522721

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INFORMATION DISCLOSURE STATEMENT PTO-1449 (PAGE 1 OF 1)	SERIAL NUMBER	DOCKET NO. P56713US
	APPLICANT CLIFFORD L. JORDAN	
	FILING DATE 28 January 2005	GROUP

U.S. PATENT DOCUMENTS

EXAMINER	DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE
	4,344,144	8/82	Damico et al.			
	4,796,467	1/89	Burt et al.			
	4,846,166	7/89	Willeke			
	4,914,957	4/90	Dougherty			
	5,245,993	9/93	McGrady et al.			
	5,289,819	3/94	Kröger et al.			
	5,318,018	6/94	Puma et al.			
	5,477,850	12/95	Zegler et al.			
	5,860,418	1/99	Lundberg			
	6,245,009	6/01	Travis et al.			
	6,425,395	7/02	Brewer et al.			
	6,435,009	8/02	Tilley			

FOREIGN PATENT DOCUMENTS

	DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION YES	TRANSLATION NO

OTHER DOCUMENTS *(Including Author, Title, Date, Pertinent Pages, etc.)*

EXAMINER:	*DATE CONSIDERED:*

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP §609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.